foreign to our own waters, and it is not improbable that of these, *Eunotia quinaria*, Ehr., and *Nitzschia Palea*, Kütz., will be found to be natives of Britain. There only remains *Hyalosira delicatula*, Kütz., and as Professor Kützing gives the Atlantic as a locality for this species, it may also prove to be indigenous.

This result demonstrates the general distribution of these organisms; and the discovery by Professor Balfour of several of the rarer forms of the Auvergne, among the lofty ridges of the Grampians, is also an interesting circumstance, showing that elevation, and consequently temperature, influence the character of the minute Diatomaceous vegetation, as well as that of the larger and more conspicuous flora of such regions.

Lewes, Nov. 29th, 1854.

EXPLANATION OF PLATE I.

Fig. 1. Side views of two valves of *Navicula firma*, var. β.
Fig. 2. *Gomphonema capitatum*, var. β. and γ.
Fig. 3. *Gomphonema Brébissonii.*
Fig. 4. *Gomphonema elongatum.*
Fig. 5. *Diatoma vulgare*, var. β.
Fig. 6. *Diatoma grande.*
Fig. 7. Filament and valves of *Fragilaria undata.*
Fig. 8. Filament and valves of *Odontidium anomalum.*
Fig. 9. *Achnanthidium lineare.*
Fig. 10. *Achnanthidium coarctatum.*
Fig. 11. Front and side view of *Amphitetras antediluviana*, var. β.
Fig. 12. *Orthosira spinosa*: *a*. Front view from a balsam mounting; *b*. Front view from a dry specimen; *c* and *c'*. Side views of frustules.

II.—*Amended Characters of the singular Lymneadous Genus* Camptoceras, *and description of a new* Ancylus, *inhabitants of North-western India.* By W. H. Benson, Esq.

In 1842, M'Clelland's 'Calcutta Journal of Natural History' contained the description of a new Lymneadous genus, which appears not to have attracted in Europe the attention which it deserves, principally in consequence of the scarcity of the publication in the pages of which it is to be found; although some pains were taken to make it more generally known by forwarding to Mr. Hugh Cuming, and to the British Museum, from India, copies of the paper and specimens of the shell. The form appears of sufficient importance to warrant the publication of revised and more extended characters of the genus, together with a few observations on its habits, and the locality in which it occurs, points shortly adverted to in the former notice.

Genus *Camptoceras*, Benson.

(Character emendatus et auctus.)

Testa sinistrorsa, imperforata, elongato-elliptica, spira soluta, apice acutiusculo, sutura late et profunde excavata (re vera omnino carente); anfractibus 3–4 angustis elongatis, superne et subtus carinatis, lateribus planulatis; apicali elongato-acuminato, longe exserto; ultimo antice superne descendente, carinato; apertura soluta, integra, magna, spiram non æquante, elongato-elliptica, angustiuscula, superne et ad basin arcuatim angulata; peristomate acuto; operculo nullo.

Species unica.

C. Terebra, Benson.

Testa elongato-elliptica, hyalina, vel albido-cornea, lineis spiralibus, exiguis, vix elevatis, striis obliquis confertissime decussatis; apertura verticali, elliptica; peristomate acuto, vix expansiusculo.

Long. vix 9, plerumque 6 ad 7 mill.

Diam. 3 mill. Long. apert. exempl. majoris 4 mill.

C. Terebra.

Syn. *C. Terebra*, Benson, Calcutta Journ. Nat. Hist. 1842.

Hab. in lacu paludoso prope Moradabad, agro Rohillano.

Animal.

Animal tentaculis duobus filiformibus, obtusis, oculis magnis inter tentacula sitis, proboscideque mediocri munitum; pallio labia testæ haud transeunte; pede brevi, longitudinem aperturæ vix superante.

The form of the tentacula and the position of the eyes, situated between the filiform tentacula, and sessile on the head (not, as in *Lymnæa*, occupying the fore part of the widened base of the triangular tentacula), at once distinguish the animal from that of *Lymnæa*. In *Camptoceras* the eyes are large in proportion to the size of the animal, while in *Lymnæa* they present only a minute black point, even in individuals of large size. In *Ancylus* also the eyes are small, and inserted in two lateral lobes proceeding from the tentacular laminæ, which are triangular and truncated*. The shortness of the foot, however, the sluggish movements of the mollusk, and its strong adhesion to smooth surfaces, point to an affinity with *Ancylus*, which, instead of presenting the elongate, imperfectly rolled, acutely spiral cone

* Vide Dupuy, Mollusques de France.

of *Camptoceras*, sinks into a widely-spread, depressed cone, with scarcely any distortion of the spire.

The animal adheres, in deep water, to the decaying stems of a reedy sedge, more frequently burrowing into them, and concealing itself between the internal layers; a habit which renders it difficult to detect.

When my lamented friend Dr. Bacon found the first specimens in my presence, the idea which immediately presented itself was that the shell was a monstrosity; however, an examination of the animal, its peculiar habits, the absence of any known shell, in the whole of India, of which it could possibly be a distorted variety, and the persistence of character in some sixty specimens, secured at various times, all concurred to dispel such a supposition.

The shell was very local, occurring in one piece of water only, of several which had evidently once formed a portion of the bed of the Ram Gunga River. Singularly enough, *Planorbis Calathus*, which we had only met with in the mountains, distant 100 miles, and at an altitude of 4000 feet, was likewise detected in, and found to be nearly restricted to, this water. In a neighbouring pond, similarly circumstanced, *Planorbis cœnosus*, nobis, was exclusively obtained; and to a third lagoon, in the immediate vicinity, was confined the shallow *Ancylus Verruca*, nobis, which I had discovered in the mountains accompanying *Planorbis Calathus*, but which proved to be also abundant in the weedy channel of the Rajhéra, distant a few miles from Moradabad. It appeared as if the original habitat of *Camptoceras* had been the scarcely explored woody mountains which give birth to the Ram Gunga, and that in a former course of the river through the broad alluvial bed in which it now wanders, these unwonted forms had been capriciously distributed in the deep hollows which had become disconnected by the retirement of the stream.

The short periodic appearance, on high grounds, near the ponds in question, of the rare *Planorbis Rotula*, nobis, Annals, vol. v. 1850, page 351 (since figured by Dunker), illustrates the uncertain appearance of some species of freshwater shells; and of this *Camptoceras* also affords an example. After the first captures, towards the end of February 1842, specimens were with difficulty procurable. In March 1843 I could not find more than three individuals, and Dr. Bacon was altogether unsuccessful. A like want of success attended a cursory effort which we made at the end of 1845. It would appear as if our researches had exhausted the supplies of the shell, which had taken possession of the water plants, within reach from the banks of the lagoon, and no means were at hand for exploring those which were farther from the shore. Possibly the animal may have

been a favourite morsel of the wild ducks which haunted the place in the cold season. It may have been more abundant in the rainy season, during July and August, but the character of the surrounding ground was not then favourable, in point of healthiness or practicability, for exploration. The extermination of an abundant but local water plant, *Anacharis Alsinastrum*, from a Scottish lake, under the relentless bill of the common Swan, serves to show how the presence of a peculiar foe may influence the propagation of certain species, whether vegetable or animal.

It is worthy of remark, that no recent species of *Physa* has hitherto been met with on the continent of India. On the other hand, it seems to be the head-quarters of *Lymnæa*, many species of which (occasionally of gigantic dimensions) swarm in every stagnant pool throughout the country, accompanied by *Planorbis Coromandelicus*, Fabr. (*Indicus*, nobis), and other species of minute types; while *Ancylus* has only been detected in a few waters in the lower ranges of the Western Himalaya, and in the plains at their feet. The other freshwater univalves, contained in the same water with *Camptoceras*, were a large *Ampullaria*, two large species of *Lymnæa*, four species of *Planorbis*, *Melania tuberculata*, and some small *Bithiniæ*. Although deficient on the continent of India, the genus *Physa* appears in Ceylon, where Mr. E. Layard procured two large species; one of which is ovate and solid, the other much lengthened and acuminate, being 32 mill. in length by 14 mill. in breadth. It exhibits no symptom of an approach to *Camptoceras* in its mode of convolution, nor in the form of the aperture, of which the columellar lip is strongly twisted.

Not having yet published the species of *Ancylus* above adverted to, its characters are now appended.

Ancylus Verruca, nobis.

Testa vix sinistrorsa, depressa, subelongato-ovata, postice vix angustiori, lævigata, pallide virente-flavida vel cinerea, tenui, intus albida, submargaritacea, antice superne convexiuscula, postice prope umbonem breviter declivi, umbone vix elevato, compressiusculo, submediano, ad spatium $\frac{3}{5}$ totæ testæ posita.

Long. $3\frac{1}{2}$, diam. vix 2 mill., alt. 1 mill.

Hab. ad lacum Bhimtâl Kemaonensem, in palude prope Moradabad, in rivo Rajhéra, necnon in rivo Sote, sive Yar Wuffadar dicto, prope Budaon Rohillarum, semper foliis plantarum aquaticarum natantibus adhærens.

Spa, Belgium, November 30th, 1854.

Having preserved living specimens of *Ancylus Verruca*, in a large glass vase of water, among floating water plants, upwards

of a month, I ascertained that these usually sluggish mollusks occasionally swam, at an early hour of the day, resupinate at the surface. I am not aware that this habit has been remarked in the genus in question by any other observer.

I find the following description of the animal of an unpublished *Physa*, which I took, in 1846, at Michelville, between Cape Town and Hottentot Holland:—

Foot narrow, hinder extremity pointed, not extending beyond the summit of the spire. Head with veliform lobes or expansions in front. Tentacula subulate, lengthened, and somewhat spread all round at the base; the eyes being situated on these prominences, between the tentacula. Mantle reflected so as to cover merely the edge of the aperture all round, exposing the whole of the breathing cavity, at the hinder part of which, near the junction of the outer lip of the shell with the body-whorl, appears a tongue-like process.

8th December 1854.

III.—*Characters of the Genus* Opisthoporus, *an Eastern form of the* Cyclostomacea, *with Remarks on its Affinities and Notes on several Opercula.* By W. H. Benson, Esq.

On my passage through Zürich, last summer, Professor Mousson kindly afforded me an opportunity of comparing a shell transmitted to me by Dr. Traill from Borneo* (identical with *Cyclostoma* (*Pterocyclos*) *Charbonnieri*, Recl., and *Cyclotus Taylorianus*, Pfr.), with the imperfect specimen of *Pterocyclos biciliatus*, Mouss., figured in the 'Mollusken von Java.' We found that they were in nowise to be distinguished from each other. I have long dissented from the received location of this, and allied species, in *Cyclotus* and *Pterocyclos*, with reference not only, in the case of the former, to the springing of a retroverted tube from the suture, but also to the formation of the operculum, which, externally, has some resemblance to the vertebra of a fish; or, as remarked by Recluz, is formed like a pulley, the broad edge of the disk being grooved or excavated in the direction of its circumference.

On a closer examination it will be found that this apparently solid operculum is formed by two layers, an inner and an outer one, the former having a horny coating: these two layers are united by an erect, internal, spiral lamina, the spaces between which are hollow and hermetically closed; and the concavity of

* Vide 'Annals' for 1853, vol. xi. N.S. p. 32 and 33.